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5/28/04

PATENT
Attorney Docket No. 203665
Client Reference No. 147352.01

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:

Shawn D. Loveland

Art Unit: 2654

Application No. 09/502,515

Examiner: Vijay B. Chawan

Filed: February 11, 2000

For: VOICE PRINT ACCESS TO COMPUTER
RESOURCES

RECEIVED

MAY 24 2004

Technology Center 2600

**TRANSMITTAL OF
APPELLANT'S APPEAL BRIEF**

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In accordance with 37 CFR 1.192, appellant hereby submits Appellant's Brief on Appeal in triplicate.

The items checked below are appropriate:

1. Status of Appellant

This application is on behalf of ☒ other than a small entity or ☐ a small entity.

2. Fee for Filing Brief on Appeal

Pursuant to 37 CFR 1.17(c), the fee for filing the Brief on Appeal is for: ☒ other than a small entity or ☐ a small entity.

Brief Fee Due \$330.00

3. Oral Hearing

☐ Appellants request an oral hearing in accordance with 37 CFR 1.194.

CERTIFICATE OF MAILING

I hereby certify that this document (along with any documents referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: May 17, 2004

Julma Del Negro

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02 FC:1254 1480.00 DA

In re Appln. of Shawn D. Loveland
Application No. 09/502,515

4. Extension of Time

- ☒ Appellant petitions for a four-month extension of time under 37 CFR 1.136, the fee for which is \$1,480.00.
- ☐ Appellants believe that no extension of time is required. However, this conditional petition is being made to provide for the possibility that appellants have inadvertently overlooked the need for a petition and fee for extension of time.

Extension fee due with this request: \$1,480.00

5. Total Fee Due

The total fee due is:

Brief on Appeal Fee	\$330.00
Request for Oral Hearing	\$ 0.00
Extension Fee (if any)	\$1,480.00

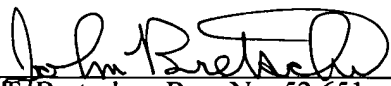
Total Fee Due: \$1,810.00

6. Fee Payment

- ☐ Attached is a check in the sum of \$
- ☒ Charge Account No. 12-1216 the sum of \$1810.00. A duplicate of this transmittal is attached.

7. Fee Deficiency

- ☒ If any additional fee is required in connection with this communication, charge Account No. 12-1216. A duplicate copy of this transmittal is attached.


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Date: May 17, 2004



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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE **RECEIVED**

In re Application of:
Shawn D. Loveland

MAY 24 2004

Serial No.: 09/502,515

Group Art Unit: 2654

Technology Center 2600

Filed: February 11, 2000

Examiner: Vijay B. Chawan

For: Voice-Print Access to Computer
Resources

CERTIFICATE OF MAILING

I hereby certify that this APPELLANT'S BRIEF ON APPEAL (along with any documents referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Appeal Brief—Patents; Commissioner for Patents; P.O. Box 1450; Alexandria, Virginia 22313-1450.

Date: 5-17-04 *Julius P. DelNaga*

APPELLANT'S BRIEF ON APPEAL

Mail Stop Appeal Brief—Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

This Appeal Brief is submitted in support of applicant's appeal from the Final Office Action of May 21, 2003. The corresponding Notice of Appeal was filed on November 17, 2003.

I. The Real Party in Interest

The Microsoft Corporation of Redmond, Washington, is the real party in interest for this appeal. The application was assigned to Microsoft by the inventor on February 9, 2000, and that assignment was recorded at the Patent and Trademark Office ("PTO") at Reel 010564, Frame 0308.

II. Related Appeals and Interferences

No appeals or interferences related to this appeal are known to the appellant, to the appellant's legal representatives, or to the appellant's assignee.

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III. Status of the Claims

This application was filed with 21 claims. Claims 10 and 16 were cancelled in a response to the PTO mailed February 28, 2003. The Final Office Action dated May 21, 2003, rejected the remaining claims, i.e., claims 1 through 9, 11 through 15, and 17 through 21, and these claims are at issue in this appeal.

IV. Status of Amendments

No amendment was filed in response to the Final Office Action and, thus, there is no outstanding amendment in this application.

V. Summary of the Invention

When a user wishes to access resources provided by a computing system, the present invention allows the user to use his voice to authenticate himself to the computing system. *See the application*, page 5, lines 6-7. In a communications environment with transmission links that support both voice and data messages (in the present application, these links are called “dual-access” or “converged”), the user vocally responds to one or more challenges posed by the computing system. *See id.* at page 2, lines 7-14; *id.* at page 5, lines 6-7. The user’s spoken responses are then sent to a speaker recognition-based authentication facility that compares those responses to one or more stored voice samples previously provided by the user during an enrollment procedure. *See id.* at page 5, lines 10-11. If the spoken responses are sufficiently close to the stored voice samples, then the user is authenticated to the computing system as a domain user or is logged onto the local system. *See id.* at page 5, lines 11-13. Once authenticated, an application proxy for the user is created, and the application proxy acts on behalf of the authenticated user. *See id.* at page 5, lines 15-16. Voice-based authentication allows the user to log in to the computing system without the aid of a keyboard, smart card, or such. *See id.* at page 5, lines 13-14.

The set of challenges changes each time the computing system is accessed in order to prevent a non-user from playing back responses previously recorded by a legitimate user. *See id.* at page 5, lines 7-10; *id.* at page 17, lines 15-17; *id.* at page 30, line 29, through page 31, line 2. To provide even greater security, the dual-access links allow this voice-authentication system to be combined with traditional text-based challenges and responses (e.g., “type in your user name and password”). *See id.* at page 29, lines 13-14; *id.* at page 30, lines 13-20.

A typical communications environment in which the present invention can be practiced is presented in Figure 2 of the application, reproduced below, and the accompanying text.

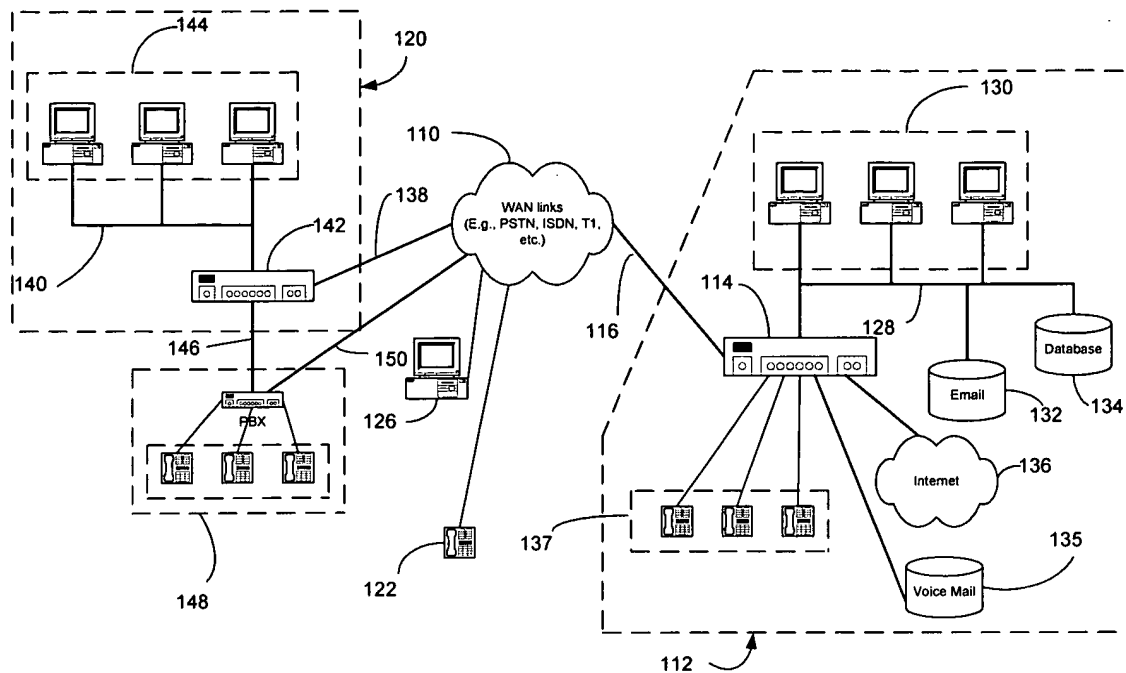
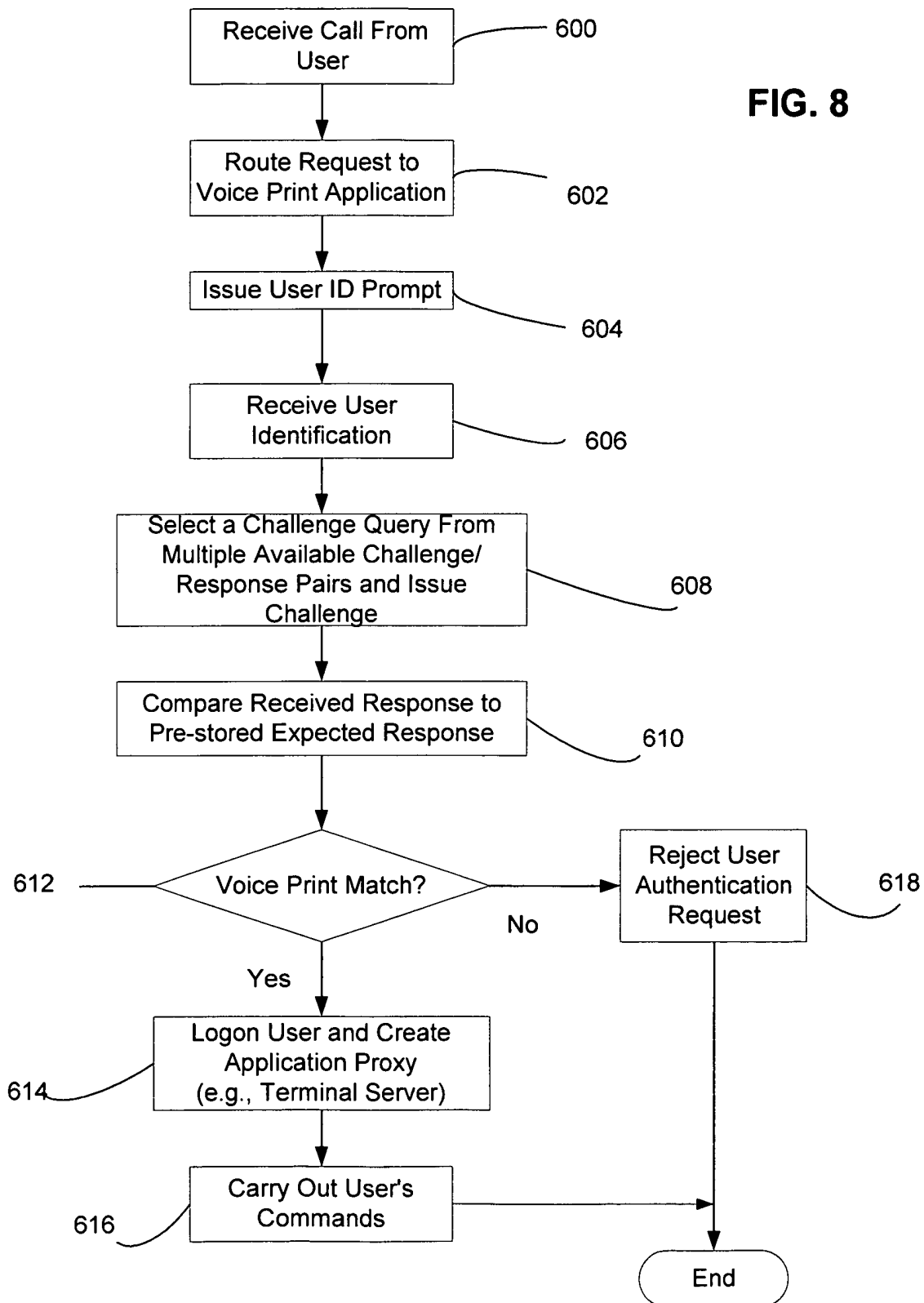


FIG. 2

The converged computing/communications environment of Figure 2 includes a local network 112. *See* the application, page 10, lines 18-19. In the local network 112, analog voice, IP voice, e-mail, instant messaging, video, fax, IP fax, and data calls are blended together and passed through a routing/rules engine within a network server 114. *See id.* at page 10, lines 19-21. (Here, “data calls” are calls that do not use audible speech commands, while “voice calls” involve spoken commands and information. *See id.* at page 14, lines 18-20. Data calls include, by way of example, Internet multimedia, video, fax, IP telephony, e-mail, web forms, and web events. *See id.* at page 14, lines 20-21.) A “converged” communications link 116 connects the network server 114 to a WAN 110. *See id.* at page 10, lines 21-22. The converged communications link 116 supports both voice and data communications between the local network 112 and the WAN 110. *See id.* at page 10, lines 23-24. While only a single link 116 is shown in Figure 2 for the network server 114, the network server 114 also includes standard telephony interfaces which the network server 114 uses when communicating over the Public Switched Telephony Network. *See id.* at page 10, lines 24-27.

Figure 8 of the application, reproduced below, and the accompanying text present details of embodiments of the methods of the present invention.



The method of Figure 8 begins in step 600 when a user requesting authentication calls into a communications server. *See id.* at page 17, lines 10-11; *id.* at page 30, lines 9-10. The user can call from any telephone or other terminal device having a suitable voice signal transducer, including, for example, an ordinary telephone, a cellular phone, or a personal computer with a microphone input. *See id.* at page 17, lines 11-13, 27-19; *id.* at page 28, line 21, through page 29, line 1. The call is forwarded to a voice-print application in step 602. *See id.* at page 30, lines 9-12. In step 604, the voice-print application invokes operations within the communications server to prompt the user to identify himself. *See id.* at page 30, lines 13-16. (Preferably the prompt is audible, but it can be text if the user's calling device has a text interface as is available on personal computers and some phones today. *See id.* at page 30, lines 14-15.) Next, during step 606 the communications server receives the user's identification which can be in the form of a sequence of touch tones or can be spoken words. *See id.* at page 30, lines 16-18. The response is converted to an alphanumeric sequence that is used to find an entry corresponding to the user within a voice-print authentication database. *See id.* at page 29, lines 5-9; *id.* at page 30, lines 18-20. Assuming that a corresponding entry is located within the database, control passes to step 608. *See id.* at page 30, lines 20-21.

In step 608, the voice-print application variably selects a challenge from a voice-print key field in the voice-print authentication database and presents the challenge to the user. *See id.* at page 29, lines 10-12, 18-25; *id.* at page 30, lines 22-23; *id.* at page 31, lines 4-5. It is important that the challenge be varied so that there is a low likelihood that a particular challenge will be repeated. *See id.* at page 17, lines 15-17; *id.* at page 29, lines 26-30; *id.* at page 30, lines 29-30. In this manner, the voice-print application provides assurance that expected user responses will be unique and reduces the system's vulnerability to imposter attacks. *See id.* at page 31, lines 1-2. To create the desired variability, the challenge can be a request to repeat a word, a phrase, a sequence of numbers, or can involve some combination of requests. *See id.* at page 30, lines 23-24. For example, the challenge can be a request to speak a word plus today's date. *See id.* at page 30, lines 24-27. In this example, it is reasonable to expect that the combination of words and phrases in the user's response will be unique every time an authorized user logs onto the system. *See id.* at page 30, lines 27-29. Alternatively, the challenge can comprise questions from a set of personal questions answered by the user during a secure registration process. *See id.* at page 31, lines 2-4.

Next, in step 610 the voice-print application receives the user's vocal response to the challenge and compares that response with a pre-stored reference response in step 612. *See id.* at page 31, lines 6-9. If the user's response comes within an acceptable range of similarity to the pre-

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stored reference response, then the user is considered authentic, and control passes to step 614. *See id.* at page 31, lines 9-11.

In step 614, the voice-print application creates a virtual user desktop for the authenticated user and logs into a network domain with credentials cached for this user. *See id.* at page 31, lines 12-14. A Microsoft Terminal Server can be used for the virtual desktop and can operate on behalf of the user. *See id.* at page 31, lines 14-15. The voice-print application retrieves the contents of a network identification/password field from the voice-print authentication database, and a logon proxy submits a logon request via a password notification message to a connected domain controller. *See id.* at page 29, lines 13-14; *id.* at page 31, lines 15-18. Thereafter, the voice-print application creates an application proxy that holds the credentials for the authenticated user. *See id.* at page 31, lines 19-20. In a network environment, the application proxy has all the credentials of the user as if the user had logged in locally via a personal computer or remotely via a remote access server. *See id.* at page 31, lines 20-22.

If at step 612, the voice-print application determines that the user's vocal response is not sufficiently similar to the pre-stored reference response, then the user's logon request is rejected. *See id.* at page 32, lines 6-9. Alternatively, the user is allowed multiple attempts to logon. *See id.* at page 32, lines 9-14. Because the user can be using any of a variety of voice devices over any of a variety of communications media, it is important that the user's vocal logon attempt not be rejected merely because a different voice transducer or a bad connection creates differences between a training sequence and a challenge response. *See id.* at page 17, line 29, through page 18, line 3. Preferably, sufficiently robust voice-match procedures, known to those skilled in the art of voice-based, user-identity verification, are performed during the comparison operation to reliably generate a positive match result when a legitimate user accesses the voice-print application. *See id.* at page 18, lines 3-6. Fail-safe authentication procedures can provide fallback mechanisms for instances where a user is improperly rejected due to changes in the user's voice because of a cold or a poor phone connection. *See id.* at page 18, lines 6-9.

VI. Issues on Appeal

There are two issues on appeal.

- (1) Whether claims 1 through 9, 11 through 13, and 21 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of U.S. Patents 6,161,090 ("Kanevsky")

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and 5,604,786 (“Engelke”). Specifically, the issue is whether this combination teaches all of the elements of these claims.

- (2) Whether claims 14, 15, and 17 through 20 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Kanevsky and Engelke. Specifically, the issue is whether this combination teaches all of the elements of these claims.

VII. Grouping of the Claims

Applicant respectfully submits that the claims pending in this application do not stand or fall together. Claims 1 through 9, 11 through 13, and 21 (“Group I”) stand or fall together. Also, claims 14, 15, and 17 through 20 (“Group II”) stand or fall together.

These groupings are appropriate under 37 C.F.R. § 1.192(c)(7). While the Final Office Action rejects all pending claims under the same rationale, stating: “Claims 14-15, 17-20 are apparatus claims to implement the method of claims 1-9, 11-13, and are similar in scope and content, and are rejected under similar rationale” (last paragraph on page 4 of the Final Office Action), this appears to be an error in the Final Office Action. The sweeping statement quoted above ignores both the “logon request” and the “logon server” elements of claim 14, elements not found in claim 1. The importance of these elements is discussed in the argument below.

VIII. Argument

To present a prima facie case of obviousness under 35 U.S.C. § 103(a), the cited references must, either separately or in combination, suggest or teach all of the elements of the rejected claims. *See* the Manual of Patent Examining Procedure § 2143.

Applicant respectfully submits that the Final Office Action has failed to establish a prima facie case of obviousness because the combination of cited references neither teaches nor suggests all of the elements of the rejected claims. Therefore, reconsideration and allowance of claims 1 through 9, 11 through 15, and 17 through 21 are respectfully solicited.

A. The Rejections

The Final Office Action dated May 21, 2003, rejected all pending claims under 35 U.S.C. § 103(a) as obvious over a combination of Kanevsky and Engelke.

Kanevsky teaches a method for authenticating a user’s identity by challenging the user and then comparing the user’s vocal responses with vocal responses stored in a database. However,

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Kanevsky's is a pure voice system and, as the Final Office Action pointed out, Kanevsky does not "specifically teach the dual-access communication interface supporting both data calls and voice calls over a same physical input." See the Final Office Action, page 3, lines 6-8. In terms of the pending independent claims 1, 14, and 21, the Final Office Action admitted that Kanevsky does not teach the emphasized elements:

Claim 1: A method for authenticating a user for access to a computer network via a network access server including *a dual-access communications interface supporting both data calls and voice calls over a same physical input*, the method comprising the steps of:

- receiving, via the dual-access communications interface, a user identification from a user seeking access to the computer network via the dual-access communications interface;*
- issuing a variable challenge query;
- receiving, via the dual-access communications interface, a voice response to the challenge query; and*
- selectively logging the user onto the computer network based upon a determination of whether the voice response to the challenge meets a matching standard with reference to a stored voice sample sequence, wherein the voice sample sequence corresponds to the user identification and the challenge query.

(Emphasis added.) (Claim 21 is a computer-readable medium or "Beauregard" counterpart to claim 1 and contains language identical to that of claim 1. Claim 14 is an apparatus claim with somewhat similar language that the Final Office Action cursorily rejected. See Section VIII.C below.)

To supply Kanevsky's admitted lack of disclosure of these recited claim elements, the Final Office Action turns to Engelke. Engelke teaches a device that can either be used as a traditional, analog voice telephone or as a Telecommunication Device for the Deaf ("TDD"). TDDs typically incorporate both a keyboard and an alphanumeric display and communicate over traditional, analog telephone lines. Hearing impaired people use TDDs to send text messages to each other in lieu of making voice telephone calls. Based on the dual functionality of Engelke's device, the Final Office Action considered that Engelke teaches a "dual-access communications interface." The Final Office

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Action then presented the combination of Kanevsky and Engelke as teaching all the elements of the pending claims.

B. The Final Office Action Failed to Establish a Prima Facie Case of Obviousness with Respect to the Claims of Group I

The combination of Kanevsky and Engelke does not teach the final element of the independent claims of Group I, that is, of claims 1 and 21: “selectively logging the user onto the computer network” While Kanevsky authenticates a user, neither Kanevsky nor Engelke teach using that authentication as a basis for logging the user onto a computer network. The Final Office Action cited Kanevsky, column 3, lines 25-50, for this element, but Kanevsky there discusses only “permitting access to a service or facility” rather than the claimed “logging onto the computer network.” Indeed, Kanevsky merely recites an authentication process but does not further disclose establishing a “user” within a network based upon the authentication of the user’s voice. Because it did not show a combination that also teaches this element, the Final Office Action failed to present a prima facie rejection of claims 1 and 21. Therefore, these claims should be allowed.

The other claims in Group I, that is, claims 2 through 9 and 11 through 13, all depend upon claim 1 and are thus allowable for at least the same reasons that claim 1 is allowable.

In addition, claims 3 through 9 add refinements to the logging on element of claim 1. As the cited combination of Kanevsky and Engelke does not even teach logging on, it certainly does not disclose these additional refinements.

Specifically, the “network security server” of claim 3 that receives a user identification and password is nowhere to be found in the cited art.

Similarly, claims 4 and 5 discuss receiving authentication credentials for a user who is *already logged on*. The cited portion of Kanevsky deals only with the authentication process itself and does not discuss authentication credentials received *afterward*.

Claim 5’s authentication proxy that carries out requests on behalf of the authenticated user is not found in the cited art. The Final Office Action’s rejection of claim 5 is puzzling: The art cited against claim 5 (Kanevsky, column 8, lines 37-55) merely discloses an alternate enrollment procedure for a user having a voice that has not yet been characterized. Neither in this portion of Kanevsky, nor anywhere in the cited art, is an authentication proxy discussed.

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The rejection of claim 6 is similarly puzzling. Claim 6 describes a notification of a successful logon attempt plus an application executed “in accordance with vocal commands received by the dual-access communications interface.” No such notification and no such application appear in the cited art. Strangely, the same portion of Kanevsky was cited against claim 6 as was cited against claim 5. That cited portion is no more appropriate here than there.

Finally, the application executed in claim 6 is further characterized as a “personal interactive voice response application” in claim 7, as a “distributed conference bridge” in claim 8, and as an “instant message application” in claim 9. Nowhere does Kanevsky or Engelke disclose these applications.

C. The Final Office Action Failed to Establish Prima Facie Case of Obviousness with Respect to the Claims of Group II

The Final Office Action’s rejection of the claims of Group II was very cursory and merely analogized these claims to those of Group I without performing any further analysis or citing particular sections in Kanevsky or Engelke. In its totality, the rejection reads: “Claims 14-15, 17-20 are apparatus claims to implement the method of claims 1-9, 11-13, and are similar in scope and content, and are rejected under similar rationale.” The Final Office Action, page 4, final paragraph.

The combination of Kanevsky and Engelke does not teach at least the following highlighted elements of the sole independent claim of Group II:

Claim 14: A system for authenticating a user for access to a computer network, the system comprising:

...

a network access server ... *issuing a logon request, including a user identification and password*, on behalf of an authenticated user determined by the comparison of the received response to the stored voice sample sequence;

a logon server coupled to the network access server and configured to receive the user identification and password from the network access server and in response providing a set of corresponding credentials for use by an application proxy.

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(Emphasis added.) As explained above with respect to the claims of Group I, while Kanevsky authenticates a user, neither Kanevsky nor Engelke teach using that authentication as a basis for “issuing a logon request” to log the user onto a computer network. Kanevsky merely recites an authentication process but does not further disclose establishing a “user” within a network based upon the authentication of the user’s voice. Further, the combination of Kanevsky and Engelke does not show a “logon server” that receives the “user identification and password” and nowhere discusses security “credentials” of the authenticated user. Finally, as with claim 5 above, the cited art does not disclose an “application proxy.” Clearly, the Final Office Action did not show a combination that teaches these elements, and therefore the Final Office Action failed to present a prima facie rejection of claims 14. Therefore, this claim should be allowed.

The other claims in Group II, that is, claims 15 and 17 through 20, all depend upon claim 14 and are thus allowable for at least the same reasons that claim 14 is allowable.

Further, pending claims 17 through 19 include the element of a “voice applications server.” Kanevsky does not disclose this voice applications server, nor does it mention the particular voice applications recited in claims 18 (“personal interactive voice response application”) and 19 (“distributed conference bridge”).


Finally, the cited art nowhere discloses or suggests claim 14’s “electronic personal assistant platform.”

Conclusion

In view of the above, applicant submits that the Final Office Action failed to establish that claims 1 through 9, 11 through 15, and 17 through 21 are obvious in light of the cited art. Accordingly, these claims should be allowable, and applicant respectfully solicits the Board to consider this Appeal, to remove the outstanding grounds of rejection, and to allow claims 1 through 9, 11 through 15, and 17 through 21.

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Respectfully submitted,

A handwritten signature in black ink, reading "John T. Bretscher", is written over a horizontal line.

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Date: May 17, 2004

Appendix: The Claims on Appeal

1. A method for authenticating a user for access to a computer network via a network access server including a dual-access communications interface supporting both data calls and voice calls over a same physical input, the method comprising the steps of:
 - receiving, via the dual-access communications interface, a user identification from a user seeking access to the computer network via the dual-access communications interface;
 - issuing a variable challenge query;
 - receiving, via the dual-access communications interface, a voice response to the challenge query; and
 - selectively logging the user onto the computer network based upon a determination of whether the voice response to the challenge meets a matching standard with reference to a stored voice sample sequence, wherein the voice sample sequence corresponds to the user identification and the challenge query.
2. The method of claim 1 wherein the variable challenge query is selected from a set of potential queries, the variable challenge query determined in a manner such that the user cannot determine, in advance of the issuing step, the challenge query.
3. The method of claim 1 wherein the logging on procedure comprises submitting a stored computer network user identification and password by the network access server to a network security server.
4. The method of claim 3 further comprising the step of receiving, in response to the submitting step, a set of credentials for a logged on user.
5. The method of claim 4 further comprising the step of creating an application proxy having the set of credentials for the logged on user, the application proxy carrying out requests on behalf of the user seeking access to the computer network.
6. The method of claim 3 further comprising the steps of receiving a notification of successful logging onto the computer network and thereafter executing an application in accordance with vocal commands received by the dual-access communications interface.

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7. The method of claim 6 wherein the application comprises a personal interactive voice response application.
8. The method of claim 6 wherein the application comprises a distributed conference bridge.
9. The method of claim 6 wherein the application comprises an instant messaging application.
11. The method of claim 1 wherein the challenge query is a request to repeat a phrase transmitted by the dual-access communications interface.
12. The method of claim 11 wherein the phrase transmitted by the dual-access communications interface is generated by a text to speech synthesizer based upon alphanumeric values.
13. The method of claim 1 wherein the challenge query is a question for which a corresponding vocal response has been recorded in an authentication database entry keyed to an identified user and the question.

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14. A system for authenticating a user for access to a computer network, the system comprising:
 - a user authentication database including for each registered user:
 - an identification, and
 - a set of vocal samples corresponding to the identification;
 - a network access server, including a dual-access communications interface supporting both data calls and voice calls over a same physical input, for receiving a user identification from a user seeking authentication via the dual-access communications interface, issuing a variable challenge query, comparing a received response to the challenge query to a stored voice sample sequence corresponding to the user identification and the challenge query, and issuing a logon request, including a user identification and password, on behalf of an authenticated user determined by the comparison of the received response to the stored voice sample sequence;
 - a logon server coupled to the network access server and configured to receive the user identification and password from the network access server and in response providing a set of corresponding credentials for use by an application proxy.
15. The system of claim 14 wherein the variable challenge query is obtained from a set of potential queries wherein the variable challenge query is determined in a manner such that a user cannot determine, in advance of issuing the challenge query, the challenge query.
17. The system of claim 14 further comprising a voice applications server supporting a set of voice applications.
18. The system of claim 17 wherein the voice applications include a personal interactive voice response application.
19. The system of claim 17 wherein the voice applications include a distributed conference bridge.
20. The system of claim 14 further comprising an electronic personal assistant platform supporting an extensible set of voice accessed applications.

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21. A computer-readable media including computer-executable instructions for performing a set of steps for authenticating a user for access to a computer network via a network access server including a dual-access communications interface supporting both data calls and voice calls over a same physical input, the steps including:
 - receiving, via the dual-access communications interface, a user identification from a user seeking access to the computer network via the dual-access communications interface;
 - issuing a variable challenge query;
 - receiving, via the dual-access communications interface, a voice response to the challenge query; and
 - selectively logging the user onto the computer network based upon a determination of whether the voice response to the challenge meets a matching standard with reference to a stored voice sample sequence, wherein the voice sample sequence corresponds to the user identification and the challenge query.